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Addition to the knowledge of *Xylaria* (*Xylariaceae, Ascomycota*) in Santa Catarina, Southern Brazil

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Abstract—*Xylaria* specimens have been collected in the State of Santa Catarina, Southern Brazil, since the 19th century, primarily by European naturalists such as Ernst Ule and Alfred Möller. Few comprehensive surveys or *Xylaria* collections have been made by Brazilians in the State until recently. New knowledge has been gained from the authors' recent survey and examination of specimens from the Florianópolis metropolitan area. Among the species discussed are a new species, *Xylaria nigromedullosa*, and eleven other species, including *X. adscendens, X. allantoidea, X. anisopleura, X. comosa, X. cubensis, X. curta, X. ianthinovelutina, X. magnoliae* var. *microspora, X. mellissii, X. obovata,* and *X. telfairii*. Most collections were obtained from dead wood, with a few found growing on fallen fruits. Seven species are new records from Santa Catarina and *X. magnoliae* is a new record for Brazil. Full descriptions, illustrations, and a key to the *Xylaria* collections now curated in FLOR are provided.

Key words — pyrenomycetes, fungal taxonomy, neotropical mycobiota

Introduction

Xylaria Hill ex Schrank is a large and cosmopolitan genus of *Xylariaceae*. It is characterized by typically having more or less carbonaceous and erect stromata, usually with a stipe and a pallid entostroma. Specimens of *Xylaria* can be found abundantly in various environments, usually growing on rotten wood (Lloyd 1918a). The taxonomy of *Xylaria* species is difficult due to the polymorphism of many species and the approximately 550 available species names (Hladki & Romero 2005). As specimens of *Xylaria* are abundant in the tropics and easily

preserved, they were widely collected in Brazil by European naturalists in the 19th and 20th centuries (Dennis 1956).

Ernst Ule made the first collections of *Xylaria* in the State of Santa Catarina on the Island of São Francisco do Sul (northeast SC). Those specimens were later analyzed and published by Pazschke (1892) and Winter (1897). *Xylaria vermiculus* Sacc., collected by Ule in the Island of Santa Catarina, was reported by Sydow & Sydow (1901). However, *X. vermiculus* was later transferred to *Batistia* by Ciferri (1958) and excluded from the *Xylariaceae*. Rehm (1901) revised a further number of Ule's *Xylaria* collections.

Alfredo Möller, who started his mycological studies in 1890, had some of his *Xylaria* collections reported by Bresadola (1896) and Hennings (1902). Stadler et al. (2008) recently transferred a xylarioid species from Santa Catarina described by Möller (1901) as *Entonaema mesentericum* to *Xylaria mesenterica* (Möller) M. Stadler et al.

Rick and Theissen collected and published many articles concerning *Xylaria* species from the State of Rio Grande do Sul (Southern Brazil) at the beginning of the 20th century (Poroca 1986, Hamme & Guerrero 1997). Despite its proximity to Rio Grande do Sul, Rick gathered only two collections from Santa Catarina.

The first Brazilian contribution on *Xylaria* from Santa Catarina was by Viégas (1944), who identified three species. Twenty years later, Batista & Maia (1964) reported two *Xylaria* species collected by Reitz and Klein.

Lloyd described and illustrated several *Xylaria* species from Brazil. Torrend, Rick and Theissen were important collaborators who sent Lloyd numerous Brazilian fungal exsiccates. Regrettably, Lloyd does not specify in his works (1917; 1918a,b,c; 1920a,b; 1922; 1923; 1924a,b,c) from which Brazilian states the specimens were gathered.

Dennis (1956), in his Tropical America's *Xylaria* study, cited six species from Santa Catarina.

Xylaria species previously reported from the State of Santa Catarina are summarized in Table 1. Our current research represents the first survey dedicated to the genus in the State and our collections represent the first *Xylaria* material to be deposited in FLOR.

Materials and methods

The State of Santa Catarina is located in Southern Brazil and covers an area of 95.346 km^2. The capital city, Florianópolis (27°35' S and 48°32' W), is located on the Island of Santa Catarina, in the central eastern portion of the State. For logistic reasons, we collected *Xylaria* primarily in the Florianópolis metropolitan area near the Federal University of Santa Catarina.

Table 1. Species of *Xylaria* previously reported from the State of Santa Catarina, Southern Brazil.

SPECIES	LOCALITY	COLLECTOR	REFERENCE
Xylaria aphrodisiaca Welw. & Curr.	São Francisco do Sul	Ernst Ule	Pazschke (1892) Winter (1897)
X. cornu-damae (Schwein.) Fr.	Jacinto Machado	Reitz & Klein	Batista & Maia (1964)
X. cylindrica Lév.	Blumenau	Ernst Ule	Rehm (1901)
X. feejeensis (as *X. obtusissima*)	Serra Geral Blumenau	Ernst Ule Ernst Ule	Rehm (1901) Dennis (1956)
X. grammica (Mont.) Fr.	Tubarão Blumenau	Ernst Ule Alfred Möller	Rehm (1901) Hennings (1902)
X. guaranitica (Speg.) Dennis (as *X. discoidea*)	not known	Johann Rick	Dennis (1956)
X. hypoxylon	São Francisco do Sul	Ernst Ule	Pazschke (1892) Winter (1897)
X. ianthinovelutina	Blumenau Blumenau	Nina Raeder Reitz & Klein	Viégas (1944) Batista & Maia (1964)
X. ianthinovelutina (as *X. dichotoma*)	São Francisco do Sul	Ernst Ule	Pazschke (1892) Winter (1897)
X. luxurians (Rehm) Lloyd	Blumenau	Ernst Ule	Dennis (1956)
X. mesenterica (as *Entonaema mesentericum*)	Blumenau	Alfred Möller	Möller (1901) Stadler et al. (2008)
X. multiplex	Blumenau	Nina Raeder	Viégas (1944)
X. nodulosa Lloyd	not informed	Johann Rick	Dennis (1956)
X. obovata	Blumenau	Nina Raeder	Viégas (1944)
X. palmicola G. Winter	São Francisco do Sul	Ernst Ule	Pazschke (1892) Winter (1897)
X. polymorpha (Pers.) Grev. (as *X.* cfr. *schweinitzii*)	Blumenau	Alfred Möller	Hennings (1902)
X. portoricensis Klotzsch	Blumenau	Alfred Möller	Bresadola (1896)
X. scruposa (Fr.) Fr.	Brusque	Renaro Jaccoud	Dennis (1956)
X. telfairii (as *X. wrightii*)	Blumenau	Alfred Möller	Hennings (1902)
X. tricolor Fr.	São Francisco do Sul	Ernst Ule	Pazschke (1892) Winter (1897)

Collected material was air-dried and analyzed macro- and microscopically. Macroscopic descriptions are based on the teleomorphic stromata. Microscopic characters were examined and measured using light microscopy. The number of ascospores and asci measured are 20 and 10, respectively. The size of ascospores is given as length versus width, with extremes in brackets. Drawings were made with a camera lucida. Analyzed materials are deposited in Herbarium FLOR (Holmgren & Holmgren 1998).

Results

Eleven previously described taxa were identified: *Xylaria adscendens, X. allantoidea, X. anisopleura, X. comosa, X. cubensis, X. curta, X. ianthinovelutina, X. magnoliae* var. *microspora*, *X. mellissii*, *X. obovata* and *X. telfairii*. *Xylaria nigromedullosa* is described as a new species. Most collections were obtained from dead wood with a few from fallen fruits.

Key to *Xylaria* species identified during the Florianópolis survey

1a. On woody fruits 2
1b. On wood 3
2a. Ascospores brown, 9–13 × 4–5.5 µm, germ slit conspicuous, on leguminous fruits ..... *X. ianthinovelutina*
2b. Ascospores yellowish to light-brown, 8–11 × 2–3 µm, germ slit inconspicuous, on *Talauma* (*Magnoliaceae*) fruits ..... *X. magnoliae* var. *microspora*
3a. Germ slit inconspicuous or seemingly absent 4
3b. Germ slit conspicuous 5
4a. Stromatal surface smooth, stromata sessile to short-stipitate, internally white, ascospores ellipsoid-inequilateral ..... *X. cubensis*
4b. Stromatal surface rugose by perithecial contours, stromata long-stipitate, internally black, ascospores broadly ellipsoid-inequilateral .... *X. nigromedullosa*
5a. Stromatal surface copper, cinnamon to light brown 6
5b. Stromatal surface dark brown to black 7
6a. Stromata up to 3 cm long, ascospores 12–14.5 × 4–5 µm, germ slit straight ..... *X. allantoidea*
6b. Stromata up to 9 cm long, ascospores 19–26(–29) × 7–8 µm, germ slit oblique ..... *X. telfairii*
7a. Stromatal apices usually bearing short, slender, pointed processes, stipe velvety, stromatal surface with whitish scales ..... *X. comosa*
7b. Combination of features differing from above 8
8a. Stromatal apices sterile, flattened or mucronate 9
8b. Stromatal apices fertile, rounded 10
9a. Stromata up to 53 mm long, apices flattened, ascospores (9–)11–14.5(–5) × 3–5 µm ..... *X. adscendens*
9b. Stromata up to 11 mm long, apices mucronate, ascospores 14–17(–19) × 6–7 µm ..... *X. mellissii*
10a. Stromatal surface with brown scales, germ slit straight, ascospores 8–11 × 3.5–5 µm ..... *X. curta*
10b. Stromatal surface without scales, germ slit oblique or spiraling, ascospores longer than 22 µm 11
11a. Fertile part moriform, ascospores 22–28 × 7–10 µm ..... *X. anisopleura*
11b. Fertile part subglobose, ascospores (25–)27–35 × 7–9 µm ..... *X. obovata*

Xylaria adscendens (Fr.) Fr., Nova Acta Regia Soc. Sci. Upsal., Ser. 3, 1: 128 (1851). FIG. 1

Stromata with fertile part cylindrical with apices sterile and flattened, single, rarely branched, often gregarious, 0.8–53 mm total length × 2–7 mm diam, stipe 7–13 mm total length × 1–2 mm diam. External surface dark brown to black, smooth to slightly roughened, punctuated by the ostioles. Internally white, cream to very light brown, becoming hollow. Perithecia completely immersed, ostioles papillate, black. Asci eight-spored, cylindrical, stipitate, 155–203 µm total length, the spore-bearing part 68–90 µm, apical ring turning dark blue in Melzer's iodine reagent, cylindrical to inverted hat-shaped, 2–3.2 × 1.5–2.2 µm. Ascospores ellipsoid-inequilateral, dark brown, unicellular, smooth, (9–)11–14.5(–15) × 3–5 µm, germ slit conspicuous, straight, running full-length of ascospore.

SUBSTRATE — undetermined decaying hardwood.

MATERIAL EXAMINED — **BRAZIL. SANTA CATARINA: Florianópolis**. U.C.A.D. col. Trierveiler-Pereira & Baltazar. 03.XII.2005 (FLOR 31921); **BRAZIL. SANTA CATARINA: Florianópolis**. U.C.A.D. col. Mozerle. 01.IX.2006 (FLOR 31932).

TAXONOMIC REMARKS — Asci are smaller than those reported by San Martín & Roger (1989), however the ascospores are typical for the species. The examined stromata do not present ramifications as those described by Dennis (1957) but are macroscopically similar to material from Southern Brazil (Hamme 1993) and French Guiana (Callan & Rogers 1990). Dennis (1957) considered *X. adscendens* as a tropical variant of *X. hypoxylon* (L.) Grev. However, Callan & Rogers (1990) defended that these two species could be separated by cultural aspects, since *X. adscendens* produces yellow pigment in culture and slightly larger conidia.

Xylaria allantoidea (Berk.) Fr., Nova Acta Regia Soc. Sci. Upsal., Ser. 3, 1: 127 (1851).

Stromata with fertile part clavate, allantoid-cylindric to globose with rounded fertile apices, unbranched, 1.4–3 cm total length × 1.4–1.9 cm diam, short-stipitate or sessile. External surface copper, cinnamon to light-brown, smooth except for papillate ostioles, becoming cracked in reticulate pattern. Internally cream to light-brown, becoming hollow. Perithecia completely immersed, more or less globose, up to 1.0 mm diam. Asci eight-spored, cylindrical, stipitate, 135–170 µm total length × 4–5 um broad, the spore-bearing part 60–80 µm, apical ring bluing in Melzer's iodine reagent, quadrate, 2 × 2 µm. Ascospores ellipsoid-inequilateral, brown, unicellular, smooth, 12–14.5 × 4–5 µm, germ slit conspicuous, straight, less than ascospore-length.

SUBSTRATE — undetermined decaying hardwood.

Material examined — **BRAZIL. Santa Catarina: Florianópolis.** Ribeirão dos Três Córregos. col. Laudares. 28.XI.1983 (FLOR 10023); **BRAZIL. Santa Catarina: Florianópolis.** São João do Rio Vermelho. col. Furlani & Loguercio-Leite. 21.III.1986 (FLOR 10308); **BRAZIL. Santa Catarina: Florianópolis.** São João do Rio Vermelho. col. Loguercio-Leite 105. 15.V.1986 (FLOR 10395); **BRAZIL. Santa Catarina: Santo Amaro da Imperatriz.** Hotel Caldas da Imperatriz. col. Trierveiler-Pereira. 26.V.2007 (FLOR 31938).

Taxonomic remarks — The examined material is typical for the species. Both *X. allantoidea* and *X. telfairii* have cinnamon stromatic surfaces, making them distinct from all others described herein. However, *X. telfairii* has larger stromata, bigger ascospores and an oblique germ slit. X. *allantoidea* also resembles *X. cubensis* (see discussion of *X. cubensis* herein).

Xylaria anisopleura (Mont.) Fr., Nova Acta Regia Soc. Sci. Upsal., Ser. 3, 1: 127 (1851). Fig. 2

Stromata with fertile part globose, subglobose to clavate, with rounded fertile apex, unbranched, solitary to cespitose, 0.6–1.1 cm total length × 0.2–0.9 cm diam, sessile or short-stipitate, stipe black, 0.1–0.5 cm high × 0.1–0.2 cm wide. External surface very dark-brown to black, moriform. Internally white, not becoming hollow. Perithecia immersed, up to 1 mm diam. Asci eight-spored, cylindrical, stipitate, 240–289 µm total length × 7–10 µm broad, the spore-bearing part 146–166 µm, apical ring turning very dark blue in Melzer's iodine reagent, urn-shaped, 5.2–7 µm high × 3.5–5 µm broad. Ascospores ellipsoid-inequilateral, very dark brown, unicellular, smooth, 22–28 × 7–10 µm, germ slit conspicuous, spiraling or oblique, less than ascospore-length.

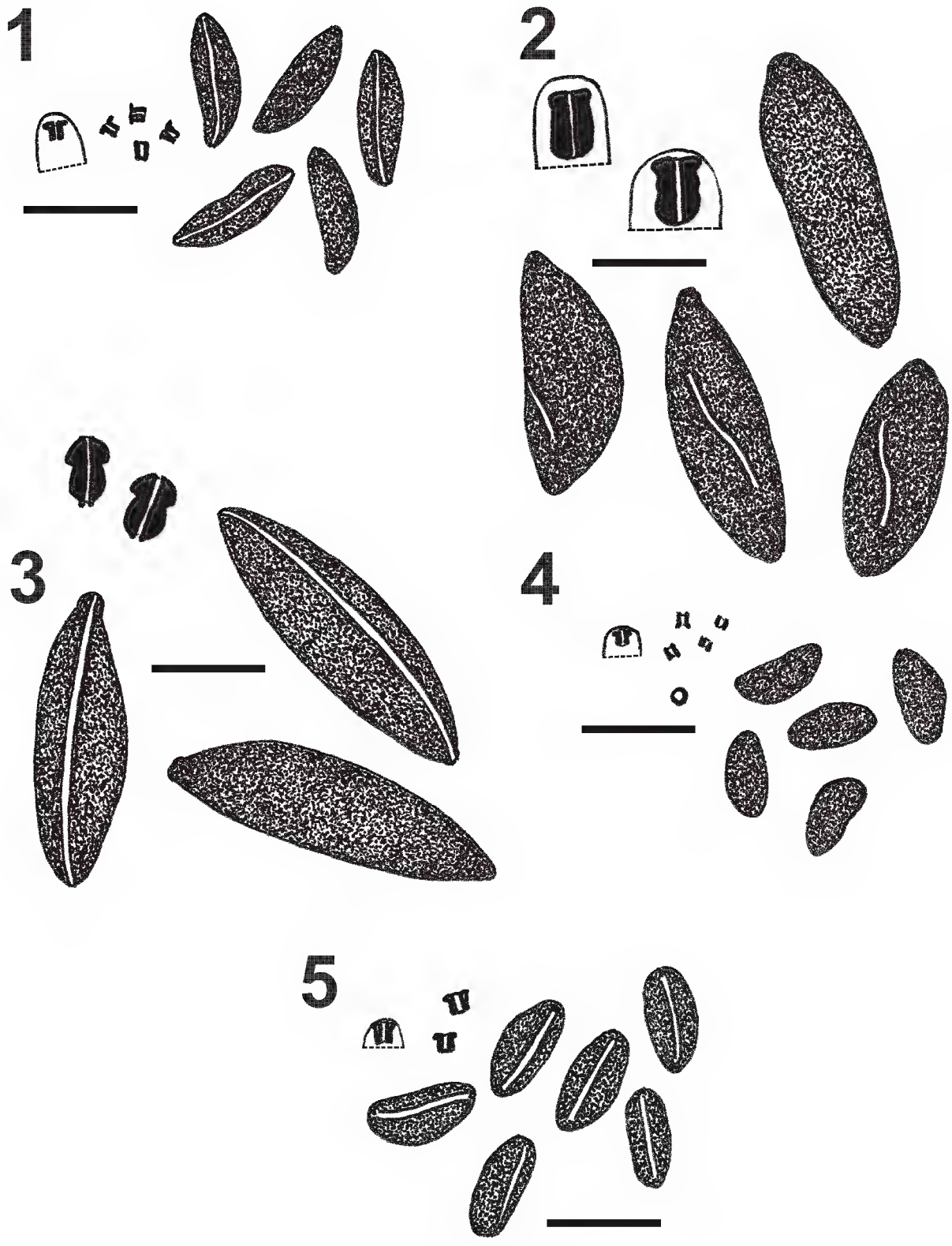
Substrate — undetermined decaying hardwood.

Material examined — **BRAZIL. Santa Catarina: Ilhota.** Morro do Baú. col. Trierveiler-Pereira. 24.X.2004 (FLOR 31916); **BRAZIL. Santa Catarina: Santo Amaro da Imperatriz.** Hotel Caldas da Imperatriz. col. Trierveiler-Pereira. 26.V.2007 (FLOR 31939).

Taxonomic remarks — The moriform fertile part and the spiraling germ slit are very characteristic of *X. anisopleura*.

Xylaria comosa (Mont.) Fr., Summa veg. Scand. Sect. Post. (Stockholm): 381 (1849) Fig. 3

Stromata with fertile part cylindrical to subglobose, apices sterile, bearing short, slender, pointed processes, unbranched, 10–15 mm total length × 6–10 mm diam, long-stipitate, stipe slender, black, velvety, 18–30 × 2–3 mm. External surface black, smooth except for whitish remnants of conidial processes, punctuated by the ostioles. Internally beige to light-brown. Perithecia completely immersed, up to 1.5 mm diam, ostioles black, discoid. Asci eight-spored, cylindrical, stipitate, the spore-bearing part 200–250 µm, apical ring



FIGURES 1-5.
1. *Xylaria adscendens*. 2. *X. anisopleura*. 3. *X. comosa*. 4. *X. cubensis*. 5. *X. curta* (scale bars= 10 μm).

bluing in Melzer's iodine reagent, urn-shaped, 6–8 μm high × 4–6 μm broad. Ascospores ellipsoid-inequilateral with abrupt pinched ends, dark brown, unicellular, smooth, 28–38 × 7–9 μm, germ slit conspicuous, straight, running full-length of ascospore.

Substrate — undetermined decaying hardwood.

Material examined — **BRAZIL. Santa Catarina: Florianópolis**. U.C.A.D. col. Trierveiler-Pereira & Marcon-Baltazar. 07.XII.2005 (FLOR 31918); **BRAZIL. Santa Catarina: Florianópolis**. U.C.A.D. col. Trierveiler-Pereira & Marcon-Baltazar. 07.XII.2005 (FLOR 31920).

Taxonomic remarks — The examined material is typical for the species (Dennis 1956, Lloyd 1917). The ascospores have straight germ slit, as does the lectotype selected by Læssøe (1999). The species can be recognized in field by the presence of pointed processes in the apex, whitish scales in the stromatic surface and velvety stipe.

Xylaria cubensis (Mont.) Fr., Nova Acta Regia Soc. Sci. Upsal., Ser. 3, 1: 126 (1851). Fig. 4

Stromata with fertile part cylindrical, cylindrical-clavate to clavate, with rounded, fertile apices, unbranched, 1.3–2.9 cm total length × 0.9–2.5 cm diam, sessile or short-stipitated, stipe smooth, black, 0.2–0.7 cm high × 0.2–0.4 cm wide. External surface dark brown to black, smooth to slightly roughened, punctuated by the ostioles. Internally white, becoming hollow and occasionally inrolling and causing a longitudinal slit in the stroma. Perithecia completely immersed, up to 1 mm diam, ostioles black, papillate. Asci eight-spored, cylindrical, stipitate, 105–140 µm total length × 4–5 µm broad, the spore-bearing part 50–70 µm, apical ring bluing in Melzer's iodine reagent, cylindrical to quadrate, 1.5–2.5 µm high × 1.5–2.5 µm broad. Ascospores ellipsoid-inequilateral, dark olive brown, unicellular, smooth, 8.5–11 × 4–5 µm, germ slit inconspicuous.

Substrate — undetermined decaying hardwood.

Material examined — **BRAZIL. Santa Catarina: Santo Amaro da Imperatriz**. Hotel Caldas da Imperatriz. col. Trierveiler-Pereira & Marcon-Baltazar. 11.VII.2006 (FLOR 31929).

Taxonomic remarks — As noticed by Rogers (1984), *Xylaria cubensis* resembles *X. allantoidea* (see description of *X. allantoidea* herein), but *X. cubensis* has smaller stromata and ascospores and an inconspicuous germ slit. The germ slit is present in most *Xylaria* species and, when present, is a constant and diagnostic feature of many well-circumscribed species (Rogers 1979a). However, some species of the genus lack this feature. Another Southern Brazilian species with inconspicuous germ slit is *X. holmbergii* Speg., which differs from *X. cubensis* primarily by larger ascospores and distinct stromatic surface (Hamme & Guerrero 1994).

Xylaria curta Fr., Nova Acta Regia Soc. Sci. Upsal., Ser. 3, 1: 126 (1851). Fig. 5

Stromata with fertile part cylindrical-clavate, with rounded, fertile apices, unbranched, single or clustered, 1.4–1.8 cm total length × 0.4–0.6 cm diam,

short-stipitate, stipe smooth, black, 0.2–0.7 cm high × 0.1–0.3 cm wide. External surface blackish with golden brown scales, roughened and with small wrinkles. Internally white and occasionally becoming hollow. Perithecia completely immersed, up to 0.5 mm diam, ostioles black, papillate. Asci eight-spored, cylindrical, stipitate, 100–160 µm total length × 4–5 µm broad, the spore-bearing part 60–80 µm, apical ring bluing in Melzer's iodine reagent, cylindrical to inverted hat-shaped, 1.5–2.0 µm high × 1.0–1.5 µm broad. Ascospores ellipsoid-inequilateral to broad ellipsoid-inequilateral, dark brown, unicellular, smooth, 8–11 × 3.5–5 µm, germ slit conspicuous, straight, running full-length of ascospore.

Substrate — undetermined decaying hardwood.

Material examined — **BRAZIL. SANTA CATARINA: Florianópolis**. Trilha para Lagoinha do Leste. col. Trierveiler-Pereira & Marcon-Baltazar. 24.VI.2006 (FLOR 31928).

Taxonomic remarks — Dennis (1956) suggested that *Xylaria curta* could be no more than a form of *X. feejeensis* (Berk.) Fr., differing in its stouter, often sessile, and clustered habit and possession of white or cream coloured scales. Rogers (1983) accepted these two species as closely related but did not consider *X. curta* a synonym of *X. feejeensis*. *Xylaria faveolis* Lloyd is considered by Dennis (1956) to represent a synonym of *X. curta*.

Xylaria ianthinovelutina (Mont.) Fr., Nova Acta Regia Soc. Sci. Upsal., Ser. 3, 1: 128 (1851). Fig. 6

Stromata with fertile part cylindrical, branched or unbranched, solitary or clustered, with sterile apices, 3.5–12 cm total length × 1–2 cm diam, stipe tomentose, reddish brown to black, up to 4.5 cm high × 0.2 cm wide. External surface reddish brown to black, tomentose, roughened with perithecia contours. Internally white, not becoming hollow. Perithecia mammiform, naked or more less immersed, up to 0.8 mm diam, ostioles black, papillate. Asci eight-spored, cylindrical, stipitate, 90–130 µm total length × 4–6 µm broad, the spore-bearing part 70–90 µm, apical ring bluing in Melzer's iodine reagent, cylindrical, 1.5–2 µm high × 1–2 µm broad. Ascospores ellipsoid-inequilateral, brown, unicellular, smooth, 9–13 × 4–5.5 µm, germ slit conspicuous, straight, running full-length of ascospore.

Substrate — fallen fruits of *Trichilia elegans* A. Juss. (*Meliaceae*) and *Inga sessilis* (Vell.) Mart. (*Mimosaceae*).

Material examined — **BRAZIL. Santa Catarina: Santo Amaro da Imperatriz.** Hotel Caldas da Imperatriz. col. Trierveiler-Pereira. 13.VII.2006 (FLOR 31931); **BRAZIL. Santa Catarina: Santo Amaro da Imperatriz.** Hotel Caldas da Imperatriz. col. Trierveiler-Pereira, Santos, Bruggeman & Galindro. 11.XI.2006 (FLOR 31933); **BRAZIL. Santa Catarina: Santo Amaro da Imperatriz.** Hotel Caldas da

Imperatriz. col. Trierveiler-Pereira, Santos, Bruggeman & Galindro 11.XI.2006 (FLOR 31934).

Taxonomic remarks — The species usually has fruits as substrate, but there are some Southern Brazilian collections on wood (Rick 1935, Theissen 1909). In this study, one other species found on fallen fruits, *X. magnoliae* var. *microspora*, differs in having navicular, lighter ascospores and an inconspicuous germ slit. Because many *Xylaria* species specific to a single host genus or family, Rogers (1979b) emphasized the importance of the host in separating the two species, with *X. ianthinovelutina* found more frequently on leguminous fruits.

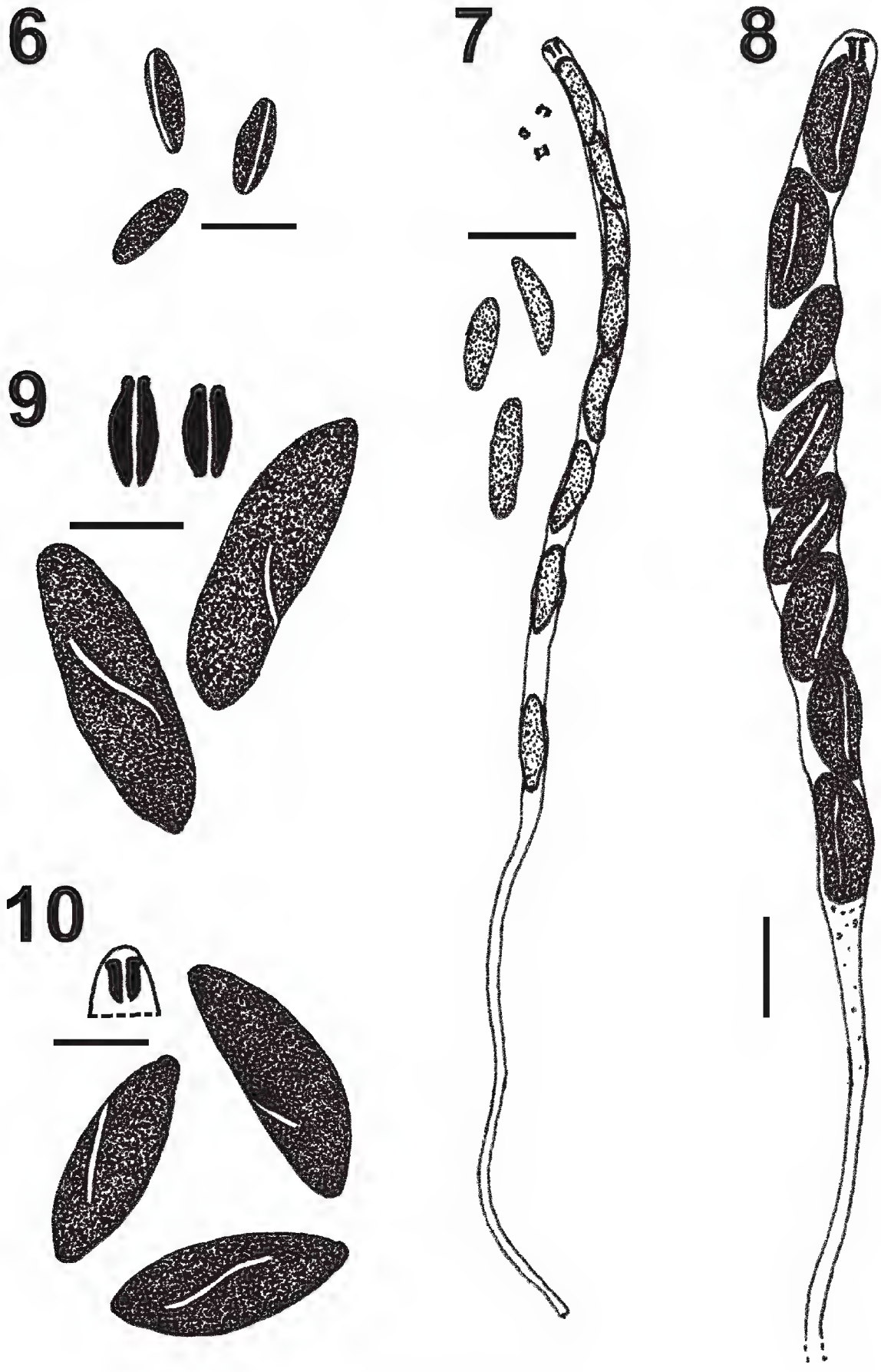
Xylaria magnoliae* var. *microspora J.D. Rogers, Y.M. Ju & Whalley, Sydowia 54(1): 96 (2002). Fig. 7

Stromata with fertile part cylindrical to irregular-cylindrical, branched or unbranched, solitary to cespitose, with sterile apices, 3.0–8.5 cm total length × 1–3 cm diam, stipe velvety to tomentose, blackish, up to 3 cm high × 0.3 cm wide. External surface blackish, tomentose, roughened with perithecia contours. Internally white, not becoming hollow. Perithecia mammiform, naked or more or less immersed, up to 0.5 mm diam, ostioles black. Asci eight-spored, cylindrical, stipitate, 104–143 µm total length × 3–4 µm broad, the spore-bearing part 59–82 µm, apical ring turning dark blue in Melzer's iodine reagent, cylindrical, 1–2 µm high × 1–1.5 µm broad. Ascospores navicular, yellowish to light-brown, unicellular, smooth, 8–11 × 2–3 µm, germ slit inconspicuous.

Substrate — fallen fruits of *Talauma ovata* A. St.-Hil. (*Magnoliaceae*).

Material examined — **BRAZIL. Santa Catarina: Florianópolis**. U.C.A.D. col. Trierveiler-Pereira. 27.VII.2005 (FLOR 31915); **BRAZIL. Santa Catarina: Florianópolis**. U.C.A.D. col. Trierveiler-Pereira & Marcon-Baltazar. 03.XI.2005 (FLOR 31917); **BRAZIL. Santa Catarina: Santo Amaro da Imperatriz**. Hotel Caldas da Imperatriz. col. Trierveiler-Pereira, Santos, Bruggeman & Galindro 11.XI.2006 (FLOR 31935); **BRAZIL. Santa Catarina: Santo Amaro da Imperatriz**. Hotel Caldas da Imperatriz. col. Trierveiler-Pereira, Santos, Bruggeman & Galindro. 11.XI.2006 (FLOR 31936).

Taxonomic remarks — *Xylaria magnoliae* J.D. Rogers was described in 1979, growing on fruits of *Magnolia* L. in North America (Rogers 1979b). Rogers et al. (2002) later described specimens from Thailand with smaller ascospores (9–11 × 3–4 µm vs 11–15 × 3–5) as *X. magnoliae* var. *microspora*. We refer our material, which also has smaller ascospores, to *X. magnoliae* var. *microspora*. All specimens were collected from fallen fruits of *Talauma ovata* (*Magnoliaceae*), a very frequent tree in Atlantic Forest (Lorenzi 2002). *Xylaria liquidambaris* J.D. Rogers et al. and *X. jaliscoensis* F. San Martín et al. are also described from *Magnolia* fruits (Rogers et al. 2002). Other fruit-inhabiting species are *X. persicaria* (Schwein.) Berk. & M.A. Curtis (from *Liquidambar* L. fruits),



FIGURES 6-10.
6. *Xylaria ianthinovelutina*. 7. *X. magnoliae* var. *microspora*.
8. *X. mellissii*. 9. *X. obovata*. 10. *X. telfairii*
(scale bars= 10 µm).

X. carpophila (Pers.) Fr. (from *Fagus* L. fruits), and *X. ianthinovelutina* and *X. culleniae* Berk. & Broome (from leguminous fruits) (Rogers 1979b).

Xylaria mellissii (Berk.) Cooke, Grevillea 11(59): 85 (1883). FIG. 8

Stromata with fertile part cylindrical, conical to subclavate, with mucronate sterile apices, branched or unbranched, 0.4–1.1 cm total length × 0.9–3.9 cm diam, long to short-stipitate, stipe black, tomentose, 0.5–1.7 cm high × 0.4–1 cm wide. External surface black, with brown peeling outer layer, roughened. Internally white, not becoming hollow. Perithecia completely immersed, up to 1 mm diam, ostioles black, papillate. Asci eight-spored, cylindrical, stipitate, 125–195 µm total length × 6–7 µm broad, the spore-bearing part 75–110 µm, apical ring bluing in Melzer's iodine reagent, cylindric to inverted hat-shaped, 2.5–3 µm high × 2–2.5 µm broad. Ascospores ellipsoid-inequilateral, dark brown, unicellular, smooth, 14–17(–19) × 6–7 µm, germ slit conspicuous, straight to slightly wavy, longitudinal, less than ascospore-length.

SUBSTRATE — dead branch of *Bauhinia variegata* L. (*Leguminosae*); undetermined decaying hardwood.

MATERIAL EXAMINED — **BRAZIL. SANTA CATARINA: Florianópolis.** HORTO BOTÂNICO DA UFSC. col. Trierveiler-Pereira. 06.III.2006 (FLOR 31924); **BRAZIL. SANTA CATARINA: Santo Amaro da Imperatriz.** HOTEL CALDAS DA IMPERATRIZ. col. Trierveiler-Pereira & Marcon-Baltazar. 11.VII.2006 (FLOR 31930).

TAXONOMIC REMARKS — Dennis (1961) treated *X. arbuscula* Sacc. as a synonym of *X. mellissii*. *Xylaria mellissii* is very similar to *X. apiculata* Cooke, which, however, has longer (≤ 25 µm) ascospores (Rogers & Samuels 1986). *X. pseudoapiculata* Hamme & Guerrero, described from Southern Brazil, which is also macroscopically similar to *X. mellissii*, has a spiraling germ slit (Hamme & Guerrero 1997). Another species with mucronate apices from Southern Brazil is *X. euphorbiicola* Rehm, which is distinguished by a smooth surface, slender stipe, and 8–10 µm long ascospores (Dennis 1957).

Xylaria nigromedullosa Trierveiler-Pereira & A.I. Romero, **sp. nov.** FIG. 11-13

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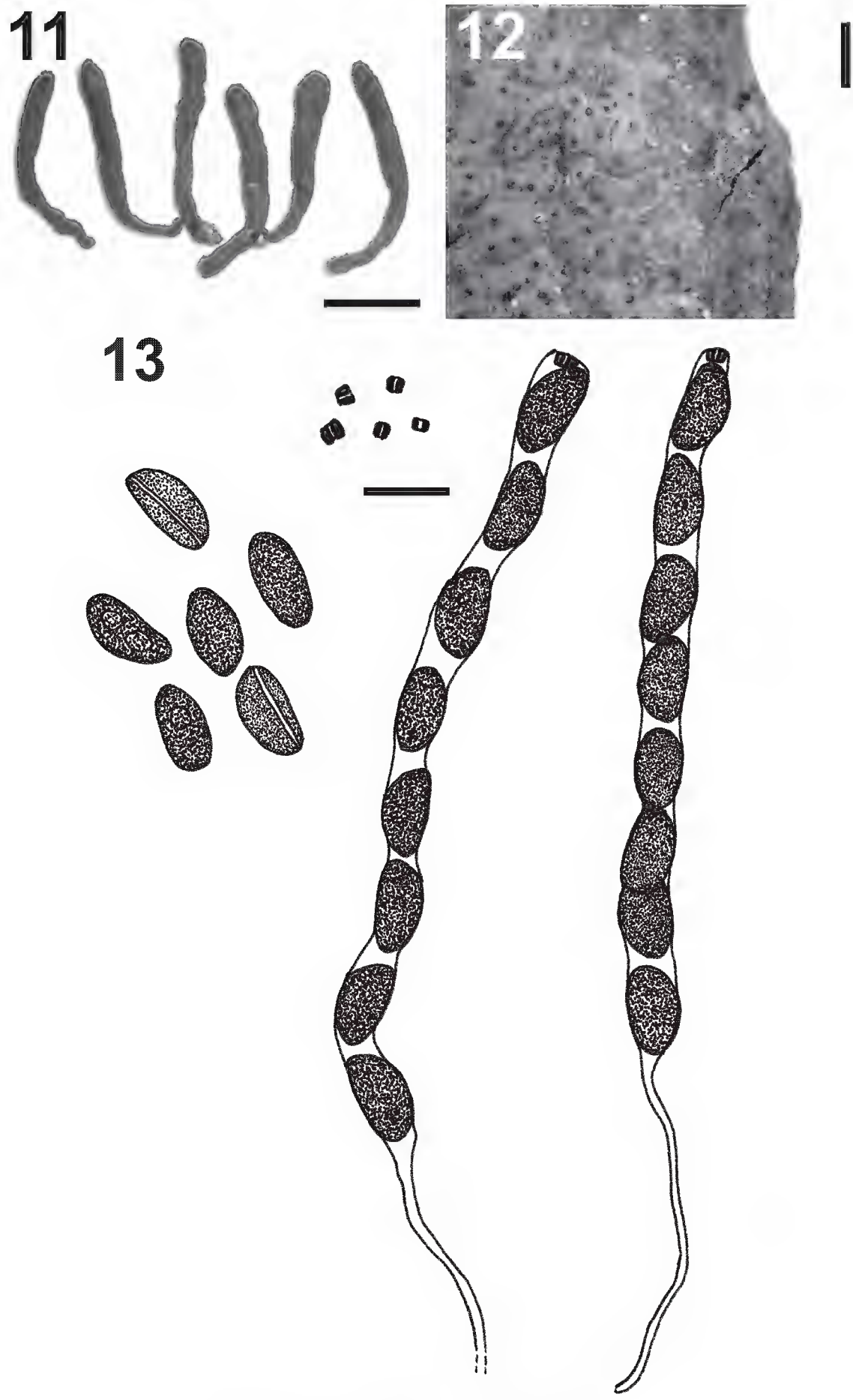
Stromata cylindracea vel cylindricea-clavata, apicibus rotundatis fertilibus, non ramosa, 3.6–5.2 × 0.4–0.7 cm, stipite glabro,1.3–2.7 × 0.2–0.4 cm. Extus brunneae vel nigra, asperata ab formis peritheciorum et papillis ostiolorum, intus nigra. Peritheciis omnino immersis, usque 0.5 mm diam, ostiolo nigro papillato. Asci octospori, cylindrici, stipitati, 122–140 longitudine tota × 6–8 µm crassi, partibus sporiferis 79–93 µm, annulo apicali in liquore Melzeri cyanescente, cylindrici vel quadrato, 1–2.5 µm alto × 1–2 µm crasso. Ascosporae late ellipsoideo-inequilaterales, brunneae vel fuliginosae, unicellulares, leves, 7–9.5 × 4–5 µm, rima germinative recta per longitudinem sporae.

HOLOTYPUS — *Brasilia, Santa Catarina, Florianópolis, U.C.A.D., ad lignum emortuum in silva, legit Trierveiler-Pereira & Marcon-Baltazar, 07.XII.2005 (FLOR 31941).*

ETYMOLOGY — the epithet refers to the characteristically black entostroma.



FIGURES 11-13. *Xylaria nigromedullosa*.
11. Stromata (scale bar = 3 cm). 12. Detail of ectostroma and ostioles (scale bar = 2 mm).
13. Ascospores, apical rings and asci (scale bar = 10 µm).

Stromata with fertile part cylindrical to cylindrical-clavate with rounded fertile apex, unbranched, 3.6–5.2 cm total length × 0.4–0.7 cm diam. Stipe smooth, long narrowed, 1.3–2.7 cm length × 0.2–0.4 cm diam. External surface dark brown to black, rugose by perithecial contours, with small wrinkles. Internally intense black, fibrous, not becoming hollow. Perithecia completely immersed, up to 0.5 mm diam, ostioles papillate, black. Asci eight-spored, cylindrical, stipitate, 122–140 µm total length × 6-8 µm broad, the spore-bearing part 79–93 µm long, with apical ring bluing in Melzer´s iodine reagent, cylindrical, quadrate to inverted hat-shaped, 2–2.5 µm high to 2–2.5 µm broad. Ascospores broadly ellipsoid-inequilateral, very dark brown, nearly black, unicellular, smooth, 7–9.5 × 4–5 µm, germ slit straight, running full-length of ascospore, very difficult to observe.

Substrate — undetermined decaying hardwood.

Material examined — **BRAZIL. Santa Catarina: Florianópolis**. U.C.A.D. col. Trierveiler-Pereira & Marcon-Baltazar. 07.XII.2005 (FLOR 31941 - holotype).

Taxonomic remarks — The presence of a black entostroma is unusual within *Xylaria*. Other species that can be internally black include *X. berkeleyi* Mont. and the termite nest fungi *X. nigripes* (Klotzsch) Sacc., *X. escharoidea* (Berk.) Fr., and *X. furcata* Fr. (J.D. Rogers, pers. comm.). *X. berkeleyi* has larger, ellipsoid-inequilateral ascospores (13–15 µm) with a germ slit much shorter than full-length (Rogers et al. 1988). The termite nest fungi have distinct stromata and much smaller ascospores (Rogers et al. 2005). San Martín & Rogers (1989) described *X.* cf. *longiana* Rehm & *X. multiplex* (Kunze) Fr. with black entostroma. These two species have ascospores that are similar in size to that described for *X. nigromedullosa*, but the species are macroscopically very distinct. Hladki & Romero (2007) described *X. fissilis* Ces. and *X. luxurians* (Rehm) Lloyd as having dark brown to black entostroma but differing from *X. nigromedullosa* in stromatic features, ascospores size, and germ slit.

Xylaria obovata (Berk.) Fr., Nova Acta Regia Soc. Sci. Upsal., Ser. 3, 1: 127 (1851). Fig. 9

Stromata with fertile part subglobose, irregular-cylindrical to reniform, with rounded fertile apex, 9–17 mm total length × 8–8.5 mm cm diam, short-stipitate. Stipe smooth, 3–6 mm length × 2–3 mm diam. External surface black, smooth to wrinkled. Internally white to cream, occasionally becoming hollow. Perithecia black, completely immersed, up to 1 mm diam, ostioles papillate, black. Asci eight-spored, cylindrical, stipitate, 135–176 µm total length × 7–9 µm broad, the spore-bearing part 95–120 µm long, with apical ring bluing in Melzer's iodine reagent, 6–10 µm high to 4–5 µm broad. Ascospores ellipsoid-

inequilateral, grayish-black, unicellular, smooth, (25–)27–35 × 7–9 µm, germ slit conspicuous, oblique, wavy, less than ascospore length.

Substrate — undetermined decaying hardwood.

Material examined — **BRAZIL. Santa Catarina: Florianópolis**. U.C.A.D. col. Trierveiler-Pereira. 2004 (FLOR 31914).

Taxonomic remarks — Obovate stromata characterize this species (Dennis 1970, Lloyd 1917), but the examined material does exhibit other stromatic shapes. The ascospores size is similar in many descriptions (Callan & Rogers 1990, Lloyd 1917, Rogers et al. 1988, Theissen 1909, Viégas 1944). Callan & Rogers (1990) described the germ slit as straight, but our material has ascospores with an oblique germ slit, also noted by Rogers et al. (1988). *Xylaria obovata* is member of the *X. polymorpha* complex (Dennis 1956, Ju & Rogers 1999).

Xylaria telfairii (Berk.) Sacc., Syll. fung. (Abellini) 1: 320 (1882). Fig. 10

Stromata robust, with fertile part clavate to cylindrical, with rounded fertile apices, unbranched, solitary, rarely gregarious, 2.3–8.9 cm total length × 1.1–2.4 cm diam. Stipe black, 2.1–3.1 cm length × 0.4–0.8 cm diam. External surface copper, cinnamon to light brown, smooth, punctuated by the ostioles. Internally white to cream, becoming hollow and inrolling. Perithecia completely immersed, up to 1 mm diam, ostioles umbilicate, black. Asci eight-spored, cylindrical, stipitate, 180–215 µm total length × 7–8 µm broad, the spore-bearing part 100–135 µm long, with apical ring bluing in Melzer's iodine reagent, urn-shaped to inverted hat-shaped, 4–4.5 × 3–4.2 µm. Ascospores ellipsoid-inequilateral, dark brown, unicellular, smooth, 19–26(–29) × 7–8 µm, germ slit conspicuous, oblique, wavy, less than ascospore-length.

Substrate — undetermined decaying hardwood.

Material examined — **BRAZIL. Santa Catarina: Florianópolis**. U.C.A.D. col. Trierveiler-Pereira & Marcon-Baltazar. 03.XII.2005 (FLOR 31919); **BRAZIL. Santa Catarina: Florianópolis**. U.C.A.D. col. Trierveiler-Pereira & Marcon-Baltazar. 07.XII.2005 (FLOR 31923); **BRAZIL. Santa Catarina: Ilhota**. Morro do Baú. Mozerle. 22.III.2006 (FLOR 31925); **BRAZIL. Santa Catarina: Florianópolis**. Horto Botânico da UFSC. Rosa. 27.III.2006 (FLOR 31926); **BRAZIL. Santa Catarina: Florianópolis**. U.C.A.D. Santos. 24.IV.2006 (FLOR 31927).

Taxonomic remarks — The examined material is typical for the species. One collection (FLOR 31925) differs from typical *X. telfairii* in having a grayish stromatal surface. Dennis (1956) considered *X. enterogena* (Mont.) Fr., *X. tabacina* (J. Kickx f.) Berk., and *X. wrightii* Berk. & M.A. Curtis synonyms of *X. telfairii*. Rogers et al. (1988), however, considered *X. telfairii* and *X. enterogena* distinct species, with *X. enterogena* distinguished by a yellow-white color and smaller stature and ascospores.

Discussion

Although *Xylaria* is considered one of the best-known genera in the family, nearly 65 new species of *Xylaria* have been described during the past 20 years, 25 of which have been described since the year 2000.

Prior to our survey, 19 *Xylaria* species were recorded from Santa Catarina State, primarily from in the northern region, which may explain why we did not re-collect some species. *Xylaria adscendens*, *X. allantoidea*, *X. anisopleura*, *X. comosa*, *X. cubensis*, *X. curta* and *X. mellissii* represent new records for the State, and *Xylaria magnoliae* var. *microspora* represents the first record from Brazil.

Our data show the importance of continuous studies on the genus, especially in the tropics, where *Xylaria* diversity is very high.

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